

# AHS TECHNICAL COMMITTEE HIGHLIGHTS

## TEST AND EVALUATION

### Test and Evaluation

By Stephen Jacklin

The AHS technical committee for Test and Evaluation is comprised of representatives from industry and government rotorcraft technology development centers. The committee considers many aspects of rotorcraft and VTOL testing, including the evaluation of components and subsystems. In addition, the committee seeks to evaluate the effectiveness of new procedures and operational solutions to problems that are encountered in the low-speed flight regime for both land and ship-based environments.

This article presents the test and evaluation committee highlights for 98-99. Though by no means comprehensive, the article includes significant efforts related to test and evaluation contributed by the committee members for their respective organizations.

### Bell Helicopter

by Joaquim Goldenberg

#### Model 427 Helicopter Development

On December 15, 1997 the Bell's newest helicopter, Model M427, lifted off at the Flight Test Center at Mirabel, Quebec, Canada. This first flight was the culmination of two years of effort to design and develop the first "true" Bell Helicopter light twin. The "twin" is powered by two Pratt & Whitney PW207D turboshaft engines and incorporates a new flat pack main transmission with direct input from the twin engines. The dynamics are based on the four bladed bearingless main rotor system and tail rotor incorporated in the Model 407. Following an initial ground

and flight envelope expansion in February 1998, the prototype headed west to Thermal, California where an intensive flight test program was started in order to establish the aerodynamic

first production helicopter are continuing testing aimed at achieving a day / night VFR Category B with Category A engine separation Type Approval by mid 1999.



configuration and determine loads on dynamic components. The second prototype helicopter performed its maiden flight in February 1998 and headed west to Thermal, joining the first prototype and together continuing the development flight testing and focusing on engine performance, cockpit layout, aircraft flight characteristics and verification of predicted performance.

The development period concluded in May and the second part of the year was dedicated to certification flight tests. The first prototype returned to Mirabel and started the certification testing including load level survey and noise survey, while the second prototype (after completing engines cooling certification tests in Thermal) headed for hot and high testing in Albuquerque, NM and Leadville, Colorado. The two prototypes and the additional

#### Model 407 Flight Testing

Flight testing of Bell Helicopter Model 407 continued during 1997 through 1998. The flight test program was mainly dedicated to product improvements. Ground and flight testing was conducted to allow the aircraft to operate at a higher gross weight of 5250 lbs for internal gross weight and 6000 lbs for external gross weight operation. Flight performance and handling qualities tests were conducted in Albuquerque, NM to establish a family of height velocity curves, adding an additional dimension to helicopter versatility. Extensive tests were also conducted to evaluate new and improved FADEC software that enables aircraft operations in a Quiet Cruise mode, signifi-

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